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The Impact of Common Currencies on Financial Markets: A Literature Review and Evidence from the Euro Area

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Abstract

This paper reviews both the theoretical and empirical literature on the impact of common currencies on financial markets and evaluates the first three years of experience with Economic and Monetary Union (EMU). If we assume that multiple currencies prevent national financial markets from integrating, a currency union can improve welfare by (i) encouraging international risk diversion through private portfolio diversification, and (ii) improving growth performance by allowing for riskier, higher-quality, more long-run investment. EMU has encouraged integration among the still fairly fragmented European financial markets both directly and indirectly. When applying the European experience to a potential North American monetary union, one should consider that the U.S. and Canadian financial markets are already more integrated than the European ones, and thus the potential gains in terms of greater financial market integration from a common currency in North America may be more moderate than in Europe.

JEL classification: E44, F21, F36, G15
Bank classification: Exchange rate regimes; Financial markets

Résumé

L'auteure examine la littérature théorique et empirique consacrée à l'incidence des monnaies communes sur les marchés financiers et dresse le bilan des trois premières années de l'Union économique et monétaire (UEM) européenne. Si l'on suppose que l'existence de plusieurs devises fait obstacle à l'intégration des marchés financiers nationaux, alors une union monétaire peut améliorer le bien-être i) en encourageant la dilution du risque international par la diversification des portefeuilles du secteur privé et ii) en permettant des investissements à plus haut risque, de qualité supérieure et à plus long terme qui stimuleront la croissance. L'UEM a favorisé directement et indirectement l'intégration de marchés financiers européens encore passablement fragmentés. Au moment d'appliquer les leçons tirées de l'expérience européenne au contexte nord-américain, on ne doit pas oublier que les marchés financiers américains et canadiens sont déjà plus intégrés que les marchés européens. En conséquence, les gains d'intégration à attendre de l'adoption d'une monnaie commune en Amérique du Nord pourraient être plus modestes qu'en Europe.

Classification JEL : E44, F21, F36, G15
Classification de la Banque : Régimes de taux de change; Marchés financiers

1. Introduction

Recent economic developments in Europe, particularly the implementation of European Economic and Monetary Union (EMU), have stimulated researchers to reinvestigate the merits and problems of monetary unions. Few of their papers explicitly analyze the impact of common currencies on financial markets and the implied welfare effects.

This paper highlights this aspect of monetary union by reviewing both the theoretical and empirical literature on the subject. Moreover, now that EMU is in its fourth year, some evidence is available regarding the euro's impact on euro-area financial markets, and those findings can be compared with theoretical predictions.

Recent studies (e.g., Frankel and Rose 2000) indicate that important welfare gains for Canada may be associated with a North American monetary union (NAMU). Those studies have stimulated public as well as scientific discussion (e.g., Chriszt 2000, and Alesina and Barro 2002). This paper contributes to that discussion.

The paper is organized as follows. Section 2 briefly reviews the main macroeconomic arguments regarding the impact of common currencies on financial markets. In section 2.1, I focus on international risk-sharing through private capital markets, and in section 2.2 I examine the growth effects of financial market integration. In section 2.3, I discuss the public policy implications of financial integration, regarding systemic risk and monetary transmission mechanisms.

Section 3 describes the development of European financial markets over the first three years of EMU. First, I investigate the direct, or mechanical, effects of EMU, such as the cost of business adjusting to the new currency, the standardization in pricing, the shrinking of the foreign exchange market, the elimination of intra-European currency risk, and the homogenization of the bond market (section 3.1). I then evaluate the indirect effects that EMU has had on European financial markets. I focus on cross-country transaction costs within the euro area and EMU's impact on the further integration of European bond and equity markets and the banking sector, and investigate the euro's role as an international transaction and reserve currency (section 3.2).

In section 4, I enquire as to what can be inferred from the European experience for North America. The growing economic integration in North America, as exemplified by the North American Free Trade Agreement, has led some observers to discuss the potential merits of a monetary union among the United States, Canada, and possibly Mexico (for instance, Buiter 1999, Laidler 1999, McCallum 1999, Murray 1999, Courchene and Harris 2000, and Macklem et al. 2000). Section 5 offers some conclusions.

2. The Welfare Effects of Common Currencies

In this section, I investigate various theoretical arguments pertaining to the welfare effects of a monetary union. The more "mechanical" effects of common currencies (e.g., transactions-cost savings on currency conversion, the loss of foreign exchange trade, or the liquidity effect reducing the transactions costs of buying and selling financial assets) are specific to each currency-union project, and they are described in more detail in section 3, which outlines the first experience of European financial markets under EMU.

Here, I focus on the two main principles regarding the long-run macroeconomic implications of monetary union operating through financial markets. The underlying assumption is that multiple currencies prevent national financial markets from integrating more deeply, thus depriving agents of the potential benefits of financial market integration.

First, I examine the benefits of risk-sharing through asset markets, whereby risk-averse agents can insure against income shocks by diversifying their portfolio across the whole unified currency area, rather than being restricted to the (smaller) national asset markets.[1] Second, I examine the theory and empirical evidence of the allegedly positive link between financial market integration and growth, and give some estimates of the potential growth effects of EMU.

2.1 International risk-sharing

2.1.1 The theory of interregional and international risk-sharing

It is a well-known result of general-equilibrium theory that if asset markets are complete, risk-averse individuals can and will fully insure against consumption fluctuations across states. In an environment that has neutral money and multiple currencies, this implies that the choice of an exchange rate regime will not have any impact on social welfare (Helpman 1981, Kareken and Wallace 1982, Lucas 1982).

In practice, however, asset markets will be incomplete and risk cannot be completely hedged, in particular at the more aggregate level, and so the exchange rate regime may indeed matter. There

1. Note, however, that the availability of assets denominated in *different* currencies can represent a source of diversification in itself. When fluctuations in the value of money reflect real economic shocks, some degree of exchange rate variability is beneficial, since it increases the insurance opportunities available through trade in nominal assets (see Helpman and Razin 1982). Thus, switching from a monetary regime with national central banks to a currency union increases welfare when the gain from eliminating excess monetary volatility exceeds the cost of reducing the variety of financial instruments in the economy (Neumeyer 1998).

are two approaches to considering the impact of the exchange rate in the context of region-specific shocks hitting the economy.

First, flexible exchange rates may substitute for other adjustment mechanisms (like price and wage adjustments or central fiscal transfers) if the latter are not available. This important insight, by Mundell (1961), underlies most of what has become known as the Theory of Optimum Currency Areas.

What is perhaps less known is that, several years later, Mundell presented a new view of common currencies as a means of smoothing shocks by better reserve pooling and portfolio diversification. According to this approach, which has recently been "rediscovered" by McKinnon (2000), countries sharing a single currency can mitigate the effects of asymmetric shocks among themselves by diversifying their income source and adjusting their wealth portfolio.

The international diversification of income source can operate through income insurance when residents of a country hold claims to dividends, interests, and rental revenue in other countries. Such ex-ante insurance allows the smoothing of both temporary and permanent shocks as long as output is imperfectly correlated.

A country's residents can adjust their wealth portfolio in response to income fluctuations by buying and selling assets and borrowing and lending on international credit markets. Such ex-post adjustment allows the smoothing of transitory shocks (Mongelli 2002, 13, and references therein).

By emphasizing the foreign exchange market's forward-looking nature, Mundell (1973) shows how future exchange rate uncertainty could disrupt the capital market by inhibiting international portfolio diversification and risk-sharing.[2] As McKinnon (1996) demonstrates, the gains from proper risk-sharing through a common currency should show up as a net reduction in risk premia on interest rates for the system as a whole.

The possibility of international risk-sharing implies that similarity of shocks is not a strict prerequisite for sharing a single currency if all members of the currency area are financially integrated and hold claims on each others' output. This point has important implications for a debate about the size of a single currency area. A common currency could be shared by countries

2. Moreover, under a flexible exchange rate regime, full risk-sharing need not be welfare-improving per se. As Sutherland (2002) shows in a two-country model with sticky prices, the welfare level achieved in the risk-sharing case is unambiguously higher than the welfare level in the autarky case *only* when monetary policy is *coordinated* (which is of course true by default under a monetary union). If it is not coordinated (as may be the case with flexible exchange rates), then the spillover effects generated by the existence of integrated financial markets can be so strong that, for some parameter combinations, autarky yields higher welfare than risk-sharing.

subject to idiosyncratic shocks as long as they can help "insure" one another through private financial markets (Mongelli 2002).

2.1.2 Evidence of risk-sharing through capital markets in Europe

Since Sachs and Sala-i-Martin (1991) published their findings about the (surprisingly) high stabilization effects of the U.S. federal budget, the empirical literature on risk-sharing has focused on the role of net transfers through central governments.

The issue of decentralized risk-sharing through private markets has received much less attention. In an early attempt to quantify the degree of risk-sharing provided by private capital markets for both the United States and Europe, Atkeson and Bayoumi (1993) find that capital flows among regions are significantly larger than those across countries, and private markets still provide a relatively limited degree of insurance against regional fluctuations.

Asdrubali, Sørensen, and Yosha (1996) try to evaluate the importance of decentralized mechanisms in relation to public aid in attenuating regional shocks for the United States. They identify two channels of risk-sharing: the insurance channel (holding of claims against the output of other regions) and the credit channel (borrowing from other regions). Their main conclusion is that, for the United States, insurance is far more important than credit for smoothing regional shocks, and credit itself is nearly twice as important as net transfers from the central government.

Melitz and Zumer (1999) revise the method developed by Asdrubali, Sørensen, and Yosha (1996), and apply it to interregional risk-sharing in the United States and Canada as well as international risk-sharing within the European Union (EU). For the United States, Melitz and Zumer (1999) qualify the results of Asdrubali, Sørensen, and Yosha (1996), claiming that insurance and credit contribute evenly to shock smoothing. They also show that interregional risk-sharing in Canada closely resembles that in the United States.

Moreover, Melitz and Zumer (1999) find that idiosyncratic shocks are larger, and smoothing lower, among EU countries than among states in the United States or provinces in Canada. More than half of the smoothing comes from risk-sharing, and all of this risk-sharing concerns insurance (diversified property holding) rather than credit.

As a methodological innovation, Melitz and Zumer (1999) distinguish between insurance through income flows and through depreciation (these two channels are summarized as "insurance" in Asdrubali, Sørensen, and Yosha 1996), and find that capital gains and losses are of much greater importance for intra-EU risk-sharing than are income flows. Moreover, openness seems to lead to more cross-ownership of resources, thus promoting risk-sharing via insurance relative to credit.

Melitz and Zumer (1999) also note that 75 to 80 per cent of idiosyncratic output shocks go unsmoothed in EU countries, which they interpret as an indication that the sacrifice associated with EMU was exaggerated by most economists.[3] Instead, EMU should foster international risk-sharing by increasing intra-EMU trade and financial integration (which favours the holding of property claims across borders and the availability of credit from other member countries).

Antia, Djoudad, and St-Amant (1999) apply the method developed by Asdrubali, Sørensen, and Yosha (1996) to international risk-sharing between the United States and Canada. They also find significant differences between interregional and international risk-sharing. While only 37 per cent of shocks go unsmoothed within Canada, as much as 48 per cent of international shocks are not absorbed between Canada and the United States. Moreover, although the insurance and credit channels are almost equally important within Canada, international risk-sharing between Canada and the United States takes place mainly through the credit channel.

Table 1 summarizes the main findings of Melitz and Zumer (1999) and Antia, Djoudad, and St-Amant (1999), thus allowing the numbers for intra-EU risk-sharing to be compared with those for international risk-sharing between the United States and Canada. We see that the fraction of unsmoothed shocks is much lower between the United States and Canada than within the EU (52 per cent versus 24 per cent). In fact, total inter*regional* risk smoothing through *private* channels (i.e., insurance plus credit) within the United States and Canada is of about the same order of magnitude (approximately 50 per cent) as total inter*national* risk smoothing between these two countries (in the latter, there is of course no role for government transfers).

Another interesting difference is that while the bulk of smoothing within the EU takes place through capital gains and losses, the dominant channel between Canada and the United States seems to be borrowing and lending, which plays virtually no role in the EU.

3. Recall that, for virtually all of the 1960–94 time period that Melitz and Zumer (1999) use in their analysis, European currencies were fixed or quasi-fixed, first through the Bretton Woods system from 1960 to 1973, and then through the "snake" and the ERM thereafter. Consequently, during this period the role of monetary policy in smoothing shocks was limited.

Table 1: Components of Risk-Sharing

Percentage of regional shocks absorbed through central government transfers, cross-border property claims ("the insurance channel"), interregional borrowing and lending ("the credit channel"), and going unsmoothed.

Interregional	Government	Insurance	Credit	Unsmoothed
U.S. 1964–90*	0.13 (7.8)	0.24 (7.6)	0.24 (6.8)	0.39
Canada 1962–94*	0.10 (6.2)	0.23 (5.79)	0.30 (7.65)	0.37

Percentage of national shocks absorbed through cross-border property claims (subdivided into income flows and depreciation), international borrowing and lending ("the credit channel"), and going unsmoothed. (Note that no international government transfers are taking place.)

International	Income flows	Capital gains/losses	Credit	Unsmoothed
EU15 1960–94*	0.08 (4.77)	0.13 (6.22)	0.02 (0.71)	0.77
U.S.-Canada 1969–95**	0.00 (0.46)	-0.12 (0.00)	0.62 (0.00)	0.48

* Source: Melitz and Zumer (1999, 39–45); numbers in brackets are *t*-statistics.
** Source: Antia, Djoudad, and St-Amant (1999, 16); numbers in brackets are *p* values.

2.2 Financial market integration and its impact on growth—theory and evidence

By eliminating exchange risk and increasing transparency, EMU is thought to contribute to ongoing financial market integration in Europe. Of course, this process is also driven by other important factors, like the Internal Market Programme[4] and financial reforms at the national level.

Financial integration has been assigned a high priority on the EU economic reform agenda adopted by the Lisbon European Council in 2000 and reaffirmed by the Stockholm European Council in 2001. To find an economic motivation for proceeding with EU financial integration, I will examine the theoretical and empirical evidence that may support the existence of a link between financial development and economic performance.

4. Adopted in 1986, the Single European Act envisaged the completion of the Internal Market Programme of the European Community (EC) by 1992. This programme required the elimination of all remaining barriers to the free movement of goods, services, capital, and labour. Based on the principle of non-discrimination, the legislative measures adopted include the prohibition of discriminatory internal taxation, quantitative restrictions and measures of equivalent effect obstructing the free movement of goods, rules governing the rights of entry and residence of EC citizens across other member countries, mutual recognition of qualifications and the single-licence principle, and the liberalization of capital movements.

2.2.1 The finance–growth nexus

The early 1990s saw a new strand of literature emerging that tried to explain the channels through which an efficient financial system can influence the two fundamental sources of economic growth: capital accumulation and technical progress.

The design of the financial system is thought to improve investment performance in the following three ways[5]:

(i) *Enhanced quality of investment*: Financial intermediaries may have more expertise and resources to devote to the evaluation and selection of projects, thus raising the profitability of investment (Greenwood and Jovanovic 1990).

(ii) *More long-term projects*: A liquid financial market allows for a larger proportion of savings to be invested in projects of a longer duration, which are typically more productive than shorter-term projects (Diamond and Dybvig 1983).

(iii) *Portfolio diversification*: If risk-averse savers can share risks through the financial system, they may be willing to allocate a higher fraction of savings to riskier projects, which stimulates specialization and thus benefits the economy's division of labour and growth (Saint-Paul 1992, Kalemli-Ozcan, Sørensen, and Yosha 2001).

Thus, efficient financial markets can improve investment performance not only by increasing the amount of available capital (through a reduction in transactions costs) but by raising their average productivity.

Thiel (2001) conducts a comprehensive survey of the available empirical evidence on the above-described finance-growth link. While there seems to be consensus about a strong impact of financial development on growth for developing countries (see Bailliu 2000), the issue for industrial countries remains controversial.

For a sample of 22 industrial countries, Table 2 shows the significance of selected financial variables in ordinary least-squares (OLS) regressions on selected economic output indicators, controlling for the impact of the gross domestic product (GDP) level and employment growth. For 6 out of the 15 possible combinations, the calculations yield a significantly positive coefficient, which is more than one would expect if the impact of finance on growth were purely accidental.

Still, the fact that a few regressions reveal a negative relation casts some doubts on the robustness of evidence derived at the aggregate level. Thus, while analysis at the aggregate level remains inconclusive, studies at the firm level yield relatively strong support for the growth-enhancing effect of finance (see Thiel 2001, and references therein).

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5. See Pagano (1993) and Levine (1997) for extensive surveys of the theory of the finance-growth link.

Table 2: Significance of Financial Variables in Cross-Country Regressions

With independent variables (i-iv) on dependent variables (A-E), controlling for GDP level and employment growth, 22 industrial countries*.

	(i) Private credit/ GDP	(ii) Stock market capitalization/ GDP	(iii) Total financing (i) + (ii)	(iv) Relative importance of stock markets
(A) GDP growth	Negative, ns	Positive, **	Positive, ns	Positive, **
(B) TFP growth	Positive, ns	Positive, ns	Positive, **	Positive, **
(C) Real investment growth	Positive, ns	Positive, *	Positive, *	Positive, ns
(D) Investment/GDP	Positive, **	Negative, ns	Positive, ns	Negative, ns
(E) Returns on capital	Negative, ns	Positive, *	Negative, ns	Positive, **

Source: Thiel (2001, 25 and 33).

* The countries are EU member states, plus the United States, Japan, Canada, Switzerland, Norway, Australia, and New Zealand. ** denotes 5 (1) per cent significance, "ns" denotes "not significant at 5 per cent". Total factor productivity (TFP) growth (B) is derived from a Cobb-Douglas production function. Variable (iv) is computed as stock market capitalization divided by private credit.

It also seems that selection and monitoring of investment is more important for industrial economies than the other transmission channels (Beck, Levine, and Loayza 2000). Moreover, there is no evidence that market-based systems are constantly superior to bank-based systems (Carlin and Mayer 1999, Beck and Levine 2002, and Demirgüç-Kunt and Maksimovic 2000). Indeed, the effectiveness of financial structures appears to depend more on completeness and adaptability in the financial system.

2.2.2 Financial integration in the EU

In this section, I evaluate the degree of financial integration in the euro area. There are two ways to test for financial market integration: first, the price convergence of financial assets can be assessed (the "arbitrage" test, or "law-of-one-price" test), and second, the intensity of cross-border financial flows can be measured (the "quantity" test), which includes testing for the independence of domestic investment from domestic savings (the "Feldstein-Horioka" test) (Mongelli 2002, 20 f.).

For the first approach, the European Commission (2001)[6] finds that the (remaining) spreads of government bond yields are better explained by differences in risk and liquidity, and hence do not appear to be segmented by national borders.[7] The report also finds that the dispersion of retail

6. This is an annual report on the economic situation and developments in the EU, published by the European Commission's Directorate General for Economic and Financial Affairs as part of their series of reports, studies, and analyses edited under the heading "European Economy."

7. For more details on the persistence of public bond yield spreads in the euro area, see section 3.2.

bank interest rates has declined, indicating a growing integration of retail banking markets in the euro area.

Moreover, the European Commission (2001) reports that in all euro-area stock markets, except for the Dutch, the explanatory power of foreign returns is indeed higher after implementation of the EMU than before, with a 57 per cent increase, on average, in the sensitivity to cross-border determinants of stock prices.

Still, caution is advised when trying to attribute the progress in integration to the EMU alone. It seems that some significant integration had already taken place prior to the EMU, as Hardouvelis, Malliaropulos, and Priestley (1999) document. They find that equity market integration in the second half of the 1990s reduced the costs of capital by around 2 per cent, mainly as a result of the reduction in the country-specific risk component.

The most prominent test for the macroeconomic implications of financial market integration originates from the seminal article by Feldstein and Horioka (1980), who argue that, for a closed economy, the balance of payments is zero by definition, and that, consequently, investment and savings are equal. Hence, in a regression of the investment share, the coefficient of the saving share, α, should be 1 for a closed economy, while in an open economy this coefficient will be smaller than one, with greater international financial integration reducing it further.[8]

Table 3 shows the results of a recent analysis along the lines of Feldstein and Horioka (1980) for the 15 EU countries as well as a control panel consisting of the United States, Canada, Japan, Switzerland, Norway, Australia, and New Zealand. For each country, the saving and investment ratios of one decade were averaged, and then an OLS regression of the investment ratio on the savings ratio was performed, using the 15 observations for the EU (and the seven observations for the control group) to generate an estimate of α.

The results show that this coefficient has gradually declined since the 1960s, although this has been an international trend, as the coefficient for the control panel indicates. Still, for the period covering 1996–2000, this coefficient of the EU estimate is not significantly different from zero for the first time.[9] Recall, however, that the small sample sizes imply very limited degrees of freedom.

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8. Feldstein and Horioka's (1980) results led to a widespread debate on their method (see, for instance, Tesar 1991 and Hussein 1998) and the interpretation of their results (Frankel, Dooley, and Mathieson 1986, Baxter and Crucini 1993, Obstfeld and Rogoff 1995, and Coakley and Kulasi 1997).

9. This does not imply, however, that what is observed for 1996–2000 is actually the "euro effect." Besides, the sample covers all member countries of the EU, not just the EMU participants; nonetheless, as Thiel (2001, 8) shows, results do not differ if the United Kingdom, Sweden, and Denmark (the three EU countries that are not participating in EMU) are excluded from the sample.

Table 3: Feldstein-Horioka Test of Financial Market Integration

Sample coverage	Cross-country OLS regression: $I/Y = constant + \alpha^*(S/Y)$			
	The EU (15 member states)		Control panel	
	α		α	
1960s	0.80	(0.060)	0.91	(0.053)
1970s	0.67	(0.051)	0.83	(0.077)
1980s	0.61	(0.070)	0.50	(0.051)
1990s	0.41	(0.068)	0.36	(0.049)
1996–2000	0.18	(0.108)	0.20	(0.067)

Source: The European Commission (2001, 158); numbers in brackets are not explained.

2.2.3 Potential welfare gains of financial integration in the EU

In the late 1980s, the EC Commission, the executive body of the EU, tasked a research team to estimate the economic benefits of a completed single market (see Emerson et al. 1988).[10] Many independent economic experts, consultants, and research institutions contributed to this project, with support from the EC Commission's departments.

One aim of this project was to quantify the reduction in the cost of financial services associated with financial integration in the EC and the impact that this could have on the economy as a whole. The team was well aware of how difficult and questionable it is to dissociate the probable impact of the EC measures to liberalize financial markets from other internal or external influences that could work in the same direction (Servais 1991).

The team estimated the prices of a series of representative financial products before and after the abolition of legislative barriers, particularly exchange controls. Their analysis was based entirely on the measures of the Internal Market Programme, and therefore it did not assume a common currency. Their main findings can be summarized as follows:

10. Recall that, at the time, the EC had only 12 members, and the Internal Market Programme was the most important project on the economic policy agenda.

- Potential price reductions in financial services[11] for the eight EC countries examined would be as high as 10 per cent, on average, implying a permanent cost reduction for the economy of about 0.7 per cent of GDP.
- The extent of the price reduction would vary substantially between countries. The sharpest fall was expected for Spain (21 per cent), followed by Italy, France, Belgium, and Germany (with 14, 12, 11, and 10 per cent, respectively), while Luxembourg, the United Kingdom, and the Netherlands would appear in the lowest category (with 8, 7, and 4 per cent, respectively).

These differences in price-reduction potential were attributed to discrepancies between the countries in terms of economic structure, competition, and regulatory environment. The major part of these reductions was expected to be realized in the retail banking sector, which has traditionally been less competitive than the wholesale banking sector.

- These direct cost reductions would induce dynamic efficiency gains through the lower cost of capital, promoting productive investment. The effects are estimated to increase EC GDP by almost 1.5 per cent.

Of course, these figures should be viewed with caution, given the methodological difficulties, heterogeneous nature of the data, and uncertainty about a number of dynamic factors potentially induced by the Internal Market Programme.

As will be described in more detail in section 3, the Single Market Programme did not fully integrate European financial markets as expected. EMU was supposed to provide further stimulus to financial market integration.

It is interesting to compare the results of this early attempt to quantify the welfare effects with a new study commissioned by the European Financial Round Table, the so-called Gyllenhammer Report (quoted in Economic and Financial Committee 2002, 12) which, based on the full implementation of EMU, suggested in February 2002 that:

(i) the potential for higher growth through financial integration could be up to 0.5 to 0.7 per cent per year, or 43 billion euros (in 2000 prices) added annually to EU GDP, and

(ii) a higher rate of return as a result of financial integration, by, for example, 1 percentage point, for investments could lower household pension contributions by as much as 5 percentage points.

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11. The financial services surveyed were banking services (consumer credit cards, mortgages, letters of credit, foreign exchange drafts, travellers cheques, commercial loans), insurance services (life insurance, home insurance, motor insurance, commercial fire and theft, public liability coverage), and brokerage services (private equity transactions, private gilt transactions, institutional equity transactions, institutional gilt transactions).

Both studies agree on the order of magnitude of the welfare potential, although one takes EMU into account, while the other does not, suggesting that EMU is not crucial in delivering these gains from integration.

2.3 Public policy aspects of financial integration

2.3.1 Financial stability and systemic risk

Financial market integration has important implications for financial stability and, as far as EMU is concerned, is associated with considerable institutional challenges. Financial crises can be defined as "episodes of financial market volatility marked by significant problems of illiquidity and insolvency of financial market participants and/or by official intervention to contain such consequences" (Bordo et al. 2001)

As documented by Bordo et al. (2001), banking and currency crises have become more frequent in recent decades (but not more severe), which suggests that the globalization of financial flows, trade, and investment has increased the scope for spillovers from country to country. To the extent that a currency union promotes financial integration, it could contribute towards strengthening or weakening of the domestic financial system.

To understand whether EMU will enhance or reduce financial stability, its impact on the causes, nature, and consequences of future financial crises must be examined. Overall, EMU is expected to foster financial stability for two reasons. First, the introduction of the euro eliminates the possibility of exchange rate adjustments or collapses among the euro countries. Second, financial integration will encourage cross-border diversification of portfolios, thus allowing for better risk spreading.

While these effects will be of the first order, second-order effects can operate in the other direction. First, to the extent that financial integration leads to increased cross-border activities not only *within* the euro area, but also *between* the euro area and third countries, which implies important foreign currency exposures, the exchange rate risk as a potential cause of banking crises is not entirely eliminated (see the European Commission 2001).

Second, EMU may intensify competition among financial institutions, which may induce individual institutions to restore profit margins by accepting a higher risk exposure (compare with section 3.2.4). Thus, while financial integration may change the nature of risks to the financial system, it makes the job of bank supervisors more difficult.

When the monetary policy functions were transferred from the national central banks to the European Central Bank (ECB), the supervisory authority was left at the national level. This diffuse system may make it harder to monitor the banking system's exposure to the risk created by single creditors borrowing from different parts of the integrated market. Along with the persistence of differences in both supervisory practices and capital standards among member nations, this puts a large premium on the efficient exchange of information (McCauley and White 1997).

The institutional set-up affects both the incentives for sound banking and the options for managing banking problems when they occur. While the existing system of deposit insurance may be associated with incentive problems, the "constructive ambiguity" of the Maastricht Treaty, which leaves the "lender-of-last-resort" issue unresolved, and the fact that EU competition policies discourage state bailouts, provide the right incentives (Prati and Schinasi 1997).

2.3.2 Homogenization of transmission mechanisms

Another possible implication that financial market integration has for public policy is the homogenization of transmission mechanisms in the euro area, which will facilitate monetary policy-making in general and crises management in particular.

McCauley and White (1997) note that differences in financial structure imply that common short-term interest rate changes will have different effects in different national jurisdictions within the same currency area. These differences are expected to diminish and eventually vanish as financial integration proceeds.

Recent evidence seems to indicate that the first effects are already visible.[12] De Bondt (2002) analyzes the retail bank interest rate pass-through[13] for the euro area and finds evidence for an acceleration of the pass-through. His estimation results suggest that the proportion of the pass-through of changes in market interest rates to bank deposit and lending rates within one month is at its highest around 50 per cent. The interest rate pass-through is higher in the long term and, notably for bank lending rates, close to 100 per cent. Moreover, a cointegration relation exists between retail bank and comparable market interest rates. The subsample results, however, are supportive of a quicker pass-through process since the introduction of the euro.

12. See section 3 for a more detailed account of the homogenization of financial assets and the structures and rules governing financial markets and banking in Europe.
13. Defined as the adjustment of retail bank interest rates to changes in the money market interest rate.

Suardi (2001), comparing the literature on economic and financial structures across countries, investigates how each channel of transmission may work differently in different countries, and how this is being changed by the introduction of the euro. Suardi's analysis indicates that the structural differences across the six euro-area countries considered (Belgium, Germany, Spain, France, Italy, and the Netherlands) are of a lesser scale than those between them and the United Kingdom or Sweden.

It seems likely that asymmetries in monetary transmission within the euro area could decrease over time as financial structures become more similar and economic agents adjust their behaviour to the new policy environment. In spite of the completion of the Single Market and the introduction of the euro, however, countries will continue to differ along many important dimensions—including, for instance, production structures, housing markets, labour markets, and legal systems—implying that a degree of heterogeneity in monetary transmission will be a persistent feature of the euro area.

3. EMU and European Financial Markets—The Experience of the First Three Years

In this section, I examine the available evidence on the European financial markets' three years of experience with EMU.

Before the euro was introduced, the framework for discussing this issue was defined by seminal International Monetary Fund (IMF) working papers by Prati and Schinasi (1997) and McCauley and White (1997). Their work was complemented and extended by Danthine, Giavazzi, and von Thadden (2000), who incorporated the first empirical evidence that became available.

This section reviews the main arguments of those researchers and confronts pre-EMU expectations with the latest available evidence. I first describe the direct, mechanical effects of EMU, the sizes of which are of course specific to EMU and cannot be generalized to other monetary union projects. I then focus on the indirect effects; i.e., the extent to which EMU contributed to integrate the various segments of European financial markets.

It is important to consider that the data presented here for the period 1999–2001 will of course not only reflect the impact of EMU, but also the impact of short-term events, such as the double crisis of the Russian sovereign default and Long-Term Capital Management in the fall of 1998, or the boom and slump of the "new economy," which are unrelated to EMU but difficult to disentangle from the data.

3.1 Direct effects

3.1.1 Costs of business adjustment

The direct costs of making the transition to a single currency (staff retraining, information-technology adjustment, note-handling costs, etc.) were apparently modest in the European securities industry. A frequently quoted study commissioned by the International Securities Market Association (Scobie 1997) polled over 1,000 market participants and found estimates of direct costs to range from European currency unit (ECU) 110,000 to ECU 8 million per firm; i.e., an average of 0.058 per cent of the total operating costs of financial institutions.

These figures are tiny compared with the estimates for the banking sector. Based on a survey of its members in March 1995, the Banking Federation of the EU estimated the costs of conversion (including the above-noted securities firms' conversion costs) to be between ECU 8 and 10 billion. This estimate must be considered low, because it does not allow for the fact that banks have to keep accounts in both national currencies and the euro during the transition period from January 1999 to 2002. According to Salomon Brothers (1996), this implies added costs of about 1 to 1.5 per cent of total revenues per year over a three- to four-year period.

3.1.2 Standardization and transparency in pricing

The introduction of a single unit of account has standardized the expression of prices of financial products and vastly simplified financial transactions. The resulting economies in transactions costs make financial markets (and non-financial markets alike) more transparent, thus contributing to the constitution of a single European capital market. According to Danthine, Giavazzi, and von Thadden (2000), these direct gains consist mainly of the time saved comparing or posting prices in several currencies and the value lost in suboptimal transactions by imperfectly informed participants. Although these gains are probably important, it seems that no reliable estimate of their size is available.

3.1.3 Shrinking of the foreign exchange market

The best way to gauge the overall economic gain caused by the shrinking of the foreign exchange market is to assess the corresponding loss in currency exchange and arbitrage revenue among EMU legacy currencies. Table 4 reports the average daily worldwide foreign exchange transactions of major currencies for the years 1995, 1998, and 2001.

Table 4: Average Daily Worldwide Foreign Exchange Transactions of Major Currencies (1995, 1998, and 2001)

	Average daily turnover in 1995 (US$billions)			Average daily turnover in 1998 (US$billions)			Average daily turnover in 2001	
	Total	Versus US$	Versus EMU currencies	Total	Versus US$	Versus EMU currencies	Total	Versus US$
U.S. dollar	1,313.4	–		1,741.0	–		1,472.7	–
EMU currencies	869.8	551.4	201.1	968.4	709.1	125.1	611.8	498.0
ECU	36.2	25.2	10.9	28.2	22.7	5.6		
Japanese yen	371.4	329.9		407.2	363.3		369.57	325.46
British pound	139.7	102.8		211.9	159.4		207.4	170.01
Canadian dollar	50.35	49.15		68.653	66.63		72.52	70.38
Total	1,571.8	1,313.4		1,981.6	1,741.0		1,617.9	1,472.7

Sources: Danthine, Giavazzi, and von Thadden (2000), Bank for International Settlements (BIS) (2001).
Notes: Because the table reports the average daily turnover in which a given currency appears on one side of a transaction, each currency is counted twice. The total (which also includes other currencies) is divided by two. In the figures for 2001, "EMU currencies" and "ECU" are replaced by the euro.

The trading volume of $125 billion in daily foreign exchange transactions between EMU legacy currencies, corresponding to 6.3 per cent of total global transactions, simply disappeared between 31 December 1998 and 1 January 1999.

Moreover, the drop in trade in U.S. dollars may also be partly attributable to EMU, since some of the trade between euro legacy currencies used the U.S. dollar as vehicle currency; this trading activity stopped with the advent of the euro as well.

If the trade volumes of foreign exchange transactions among EMU legacy currencies are weighted by unit transaction costs (Hartmann 1997), we get a first impression of the economic gains involved. Based on the BIS Triennial Report of 1995 (see Table 4), Salomon Brothers (1996) estimated that net revenues derived from foreign exchange trading might fall by 10 to 15 per cent per year, implying about a 1 per cent decline in total revenues for the banking system.

For the arbitrage business, Scobie (1997) reports that market participants have estimated that they will lose up to 60 per cent of their European bond business and up to 30 per cent of their swap business due to the elimination of the 10 different local currencies. These revenue losses represent

an overall economic gain, as the real resources that were used up in currency trading are now free for more productive uses.

It is also interesting to compare the transactions volume of the Canadian dollar versus the U.S. dollar with that between euro legacy countries. Note that the Can$/US$ average daily *worldwide* turnover amounted to US$70 billion in 2001, of which roughly US$25 billion took place inside Canada,[14] which is almost one fifth of the intra-euro-area trade in 1998 (US$130 billion). Considering the relative sizes of the economies involved, these figures are striking and point to important potential efficiency gains for Canada from a NAMU.

3.1.4 Elimination of intra-European currency risk

As Danthine, Giavazzi, and von Thadden (2000) acknowledge, exchange rate risk had traditionally been an important component of intra-European market risk, in particular for longer-term contracts.

Based on the methods developed in an earlier study (De Santis and Gerard 1998), De Santis, Gerard, and Hillion (1999) show that, in the 1990s, EMU countries' currency risk was a significant risk factor for investors, although it had declined over the decade. They also find that non-EMU currency risk was quantitatively much larger, in particular the risk associated with the U.S. dollar.

In shaping trade and investment patterns, the currency risk has considerable macroeconomic implications. For equity markets, Fratzscher (2001) finds that, after controlling for real and monetary policy convergence, exchange rate volatility still is very useful for explaining the development of financial market integration. Higher exchange rate volatility among EU currencies led to a lower degree of integration, particularly in France and Denmark, but also in Sweden, the United Kingdom, and the Netherlands.

3.1.5 Homogenization of the private and public bond markets

As predicted by McCauley and White (1997), the euro created a single private yield curve across the euro area. Except for shorter maturities, where interbank-offered rates are used, such national private yield curves are constructed from the best rates on the fixed sides of interest-rate swap

14. In 2001, the total daily turnover of foreign exchange *in Canada* was US$41.6 billion; transactions that had the U.S. dollar on one side amounted to US$40 billion, of which US$25 billion had the Canadian dollar on the other side.

contracts offered by banks in the country in question (Danthine, Giavazzi, and von Thadden 2000).

At the long end, national private reference rates had almost completely converged for Belgium, France, Germany, and the Netherlands by mid-June 1996, reflecting the fact that market participants attached a high probability to stable exchange rates among these currencies. Since January 1999, the ECB has formally documented a private euro yield curve, derived from interest rate swaps.

For shorter maturities, full convergence was achieved by mid-February 1997 (Danthine, Giavazzi, and von Thadden 2000); meanwhile, EONIA (Euro Overnight Index Average) and EURIBOR (Euro Inter-Bank Offer Rate) are fully accepted as uniform price references by operators in this market segment (European Commission 2001, 138).

For the public debt markets, the outlook for a euro yield curve is much more problematic. Although some convergence in the yield spreads on government bonds could be observed since the advent of the euro, the markets for euro-area government bonds remain segmented.[15]

Nonetheless, the euro has directly affected the structure of these markets. As early as 1995, the EU governments had decided that, as of January 1999, all new fungible public debt by EMU member states should be issued in euros. The question of how to proceed with the outstanding debt still denominated in the legacy countries remained unsettled for a long time.

The French and Belgian governments opted very early in favour of redenomination, whereas the German government had serious concerns about the costs and technical difficulties of such a switch. Fear of losing the benchmark status to France was probably a decisive factor in the German government's decision, on 9 June 1998, to fully convert existing German fungible federal debt by 1 January 1999.

In the wake of this decision, all remaining EMU countries followed suit, thus adding large volumes to the long end of the yield curve as well as creating euro markets for shorter maturities (see Danthine, Giavazzi, and von Thadden 2000).

15. See section 3.2.2 for a more detailed discussion and possible explanations for this segmentation.

3.2 Indirect effects

3.2.1 Cost of cross-country transactions within the EMU area

While the euro had important direct implications in decreasing transactions costs, it also highlighted the remaining heterogeneities obstructing cross-border investment activities within the euro area. In particular, cross-border clearing and settlement are substantially more expensive and risky than domestic clearing and settlement. One symptom of this problem is the euro area's highly complex infrastructure: it has 18 large-value transfer systems, 23 securities-settlement systems, and 13 retail-payments systems, compared with two large-value transfer systems, three securities-settlement systems, and three retail-payments systems in the United States[16] (Padoa-Schioppa 1999).

The Giovannini Group of Financial Market Experts, formed in 1996 to advise the EC Commission on issues relating to EU financial integration and the efficiency of euro-denominated financial markets, recently examined the efficiency of current arrangements for clearing and settlement of cross-border securities transactions in the EU. The Giovannini Group (2001) find that per-transaction income (used as a proxy for settlement costs) of the International Central Securities Depositories (ICSDs) in Europe, which process predominantly cross-border trades, is about 8 to 10 times higher than per-transaction income of national CSDs, which process predominantly domestic transactions (Table 5).

The Giovannini report also shows that European domestic settlement systems are comparable with the U.S. or Swiss systems in terms of efficiency, suggesting that important economic gains could be realized if the cost of cross-border transactions within the euro area were brought down to domestic levels.

The Giovannini report identifies technical requirements, market practices, taxation, and legal uncertainty as the main barriers to a more efficient settlement of cross-border payments within the euro area. Although the report favours a market-driven restructuring as far as technical requirements and market practices are concerned, it calls upon the public sector to remove fiscal and legal obstacles.

16. A vast reorganization is underway and already well advanced in large-value transfer systems. By contrast, securities-settlement systems have only just started to move, and the restructuring of retail-payments systems is yet to come.

Table 5: Comparisons of Per-Transaction Income

	Organization	Operating income (in euros)	Transactions (post-meeting)	Operating income per transaction (in euros)
European ICSD	Euroclear Bank	360,590,000	11,000,000	32.78
European ICSD	Clearstream Luxembourg	401,175,000	12,000,000	33.43
EU	EU domestic and internat'l CSDs	1,644,565,272	319,662,321	5.14
	EU excl. ICSDs	882,800,272	296,662,321	2.98
Swiss ICSD	SIS	103,231,065	17,745,900	5.82
U.S. CSD	DTCC++	638,261,727	230,271,931	2.77

Source: Giovannini Group (2001, 40).

Along these lines, an Economic and Financial Committee (2002) report recommends fast implementation of the measures described in the Financial Services Action Plan, which addresses issues such as cross-border use of collateral and use of clearing and central counterparty facilities in other jurisdictions within the EU by market participants.

Banks face a similar situation. In a 1999 study by the ECB (see Danthine, Giavazzi, and von Thadden 2000), it became evident that fees charged to customers by euro-area banks for domestic credit transfer were considerably lower than for euro-area cross-border transactions (euro 0.10 to 0.15 for a domestic credit transfer independent of the amount transferred, compared with euro 3.5 to 26 for small amounts and between euro 31 and 400 for higher amounts transferred across the border), and domestic payments would arrive at their destination much faster (usually 1 to 3 days) than cross-border payments (which need 4.8 working days, on average). Little seems to have changed since the publication of this study (see Padoa-Schioppa 2001).

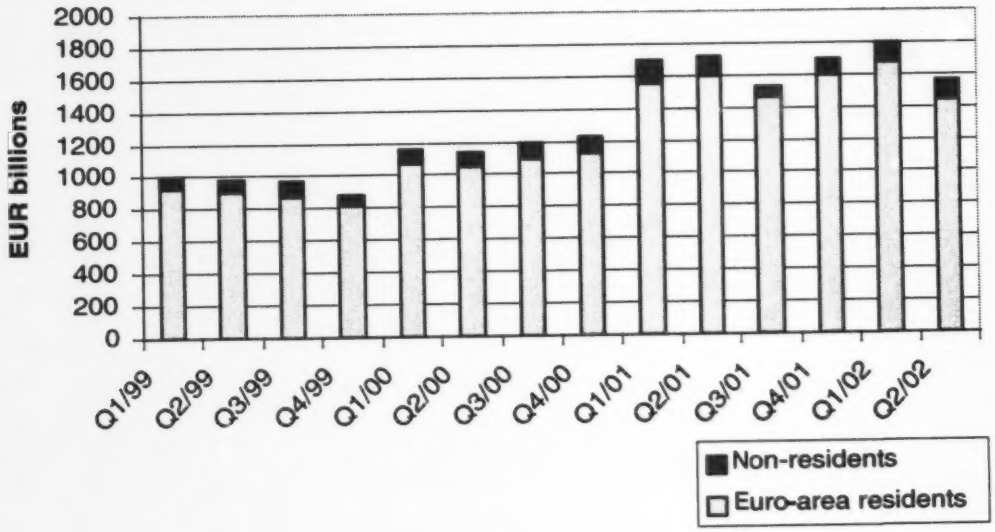
The inception of the euro increased the visibility of the inefficiencies described above and renewed pressure on politicians to adopt institutional reforms that foster harmonization and efficiency in European financial markets. The first steps taken in this direction are the establishment of TARGET and EURO1, the real-time gross settlement systems of the European System of Central Banks and European Banking Association, and the implementation (in August 1999) of the Eur Directive 97/5/EC on cross-border credit transfer.

3.2.2 Euro-denominated bond markets

By eliminating the currency risk and reducing transactions costs, EMU has contributed to the creation of more homogeneous, liquid euro-area bond markets. The increase in transparency has put traders in foreign euro-denominated assets on an equal risk base with domestic traders, who can now focus on the less volatile risks, including credit, liquidity, settlement, legal, and event risks (Prati and Schinasi 1997).

The greater liquidity and depth of the euro-denominated markets has been reflected in higher issuance rates, in particular during 1999 and 2000. Figure 1 shows total euro-denominated bond issuance for January 1999 until June 2002 by residency of issuers. Note that the abrupt jump in January 2001 can be explained by the enlargement of the euro area to include Greece.

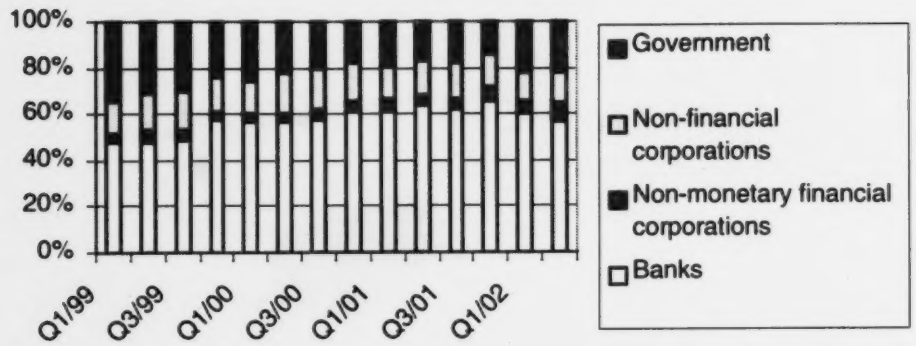
Figure 1: Total Euro-Denominated Bond Issuance by Residency of Issuer



The euro proved to be an attractive issuance currency for non-euro-area residents as well, in particular for less-developed countries. Their share in total issuance remained at a fairly stable level of 7 to 9 per cent during 1999 and 2000, dropped to 5 per cent during 2001, and reached 8 per cent again in mid-2002. Thus, the euro has emerged as the second most important currency for international bond issuance, behind the U.S. dollar.

Moreover, the composition of bond issuance changed notably compared with before the introduction of EMU. Figure 2 shows that, while the government remains the primary supplier of bonds, there has been a sharp rise in non-sovereign issuance, with the combined issuance of the corporate and financial sectors more than quadrupling since 1998.

Figure 2: The Composition of Euro-Denominated Bond Issuance

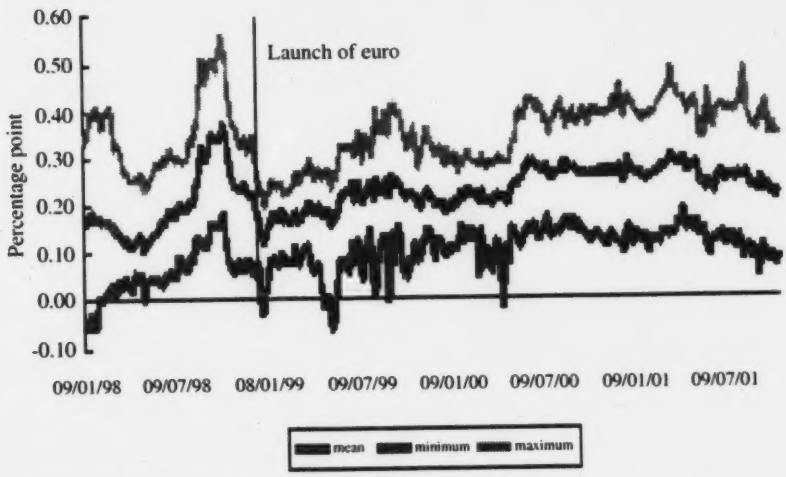


Source: ECB Monthly Bulletin, April 2000, April 2001, March 2002, September 2002.

But the government bond market will be examined first. As Figure 3 shows, the public bond markets remain fairly segmented. Yields did converge significantly during the run-up to the EMU, which was in marked contrast to the situation that existed as recently as the mid-1990s. This convergence in yields can be attributed to the elimination of exchange risk in the EMU and to the relative improvement in budgetary conditions in several of the member states.

Since the end of 1998, however, yield spreads have widened again, showing that there is still considerable fragmentation in this market segment, much of which reflects the fact that government bonds are issued by 12 separate agencies with different needs, strategies, procedures, and instruments (European Commission 2001). Of course, government bonds of different issuers will not be perfect substitutes if there are substantial differences in credit risk and there is no common liability for a sovereign's debt; i.e., if the "no-bail-out" clause of the Maastricht Treaty (Art. 104b) is considered as credible by market participants.

Figure 3: Yield Spreads on Government Bonds in the Euro Area



Source: The European Commission (2001, 140).

If we measure sovereign risk by a country's credit rating,[17] we can observe that a lower rating still implies a higher cost of borrowing: as a country's rating deteriorates by one grade, it must expect an increase in yield of about 10 to 15 basis points. Differences in bond yields between countries within the same ratings group vary considerably, however, indicating that differences in credit risk do not fully explain the observed heterogeneity of government bond yields (e.g., 20 basis points within the group of top-rated countries alone).

The most likely explanation, then, is that liquidity premia have emerged as an important determinant of the euro-area government yield spreads; in fact, markets have traditionally attached a higher liquidity risk to non-German public bonds than to German ones (which are served by very liquid futures contracts, allowing for better hedging) (Danthine, Giavazzi, and von Thadden 2000, 17).[18]

A possible response to this problem, which was considered by the Giovannini Group in 2000, is to coordinate government debt issuance in the euro area, at least on technical aspects of issuance, if not to establish a single benchmark issuer for the euro area as a whole (European Commission

17. Note that, as of September 2002, Moody's and Standard and Poor's sovereign ratings coincide for all EMU member countries except Spain.
18. Thus, the European experience contradicts Grubel (2000), who expects the Canadian-U.S. yield spread to diminish to a negligible size in case of a NAMU.

2001, 141).[19] One concern associated with this proposal is that markets may interpret co-operation as co-responsibility, an impression that the Maastricht Treaty seeks to avoid explicitly.

Just as for the public bond markets, it was expected that the elimination of the currency risk and the reduction in transactions costs brought about by EMU would make the euro-area private bond market more attractive both for borrowers and investors, thus contributing to the process of disintermediation and securitization in Europe (see Prati and Schinasi 1997).

The actual development of the euro private bond market in 1999 still came as a big surprise. Though some of this surge may reflect short-term effects, such as the release of pent-up demand, the telecom boom, and the desire to set benchmarks with euro issues, 1999 marks a fundamental switch of market behaviour on a truly European scale, with non-sovereign issuance (including the financial sector) more than quadrupling (European Commission 2001, 138 ff.).

But not only did aggregate volumes increase dramatically; the size of the largest issues increased substantially, with issues above 1 billion euros becoming more and more frequent. In addition, the average rating of companies issuing bonds fell significantly: while almost 50 per cent of non-sovereign issuance was still AAA in 1996, as much as 46 per cent of all corporate bonds issued in the first three quarters of 1999 had a single A credit rating.[20] The evidence also suggests that cross-border ownership of corporate bonds increased substantially (Field, Humphreys, and Sokolov 2000).

Because the dramatic increase in bond supply, in particular by non-residents, was the driving force behind the expansion of the private bond market, this development was blamed for the weak stance of the euro exchange rate vis-à-vis the dollar during most of 1999 and 2000. This early supply of euro bonds by non-euro-area residents, which clearly exceeded the euro-predecessor currency aggregate, has actually been absorbed so far by euro-area residents and not by outside investors (Detken and Hartmann 2000).

In 2000, the bond market experienced a trend decline in euro issuance, due to a return to a more normal rhythm of issuing activity, reduced government borrowing needs, and a progressive deterioration in market sentiment, whereas 2001 saw a renewed surge of issuance, particularly during the first few months of the year.

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19. Note that the euro government bond market is not expected to expand much on the supply side, as governments try to cut deficits to meet the requirements of the Stability and Growth Pact.
20. To date, no "EU junk bond market" has emerged that would be comparable with the U.S. junk bond market, where outstanding bonds of non-investment-grade firms rose to over $200 billion in 1996, equivalent to about one quarter of outstanding corporate bank loans.

As new data become available, it is possible to analyze first trends emerging from the experience of the last three years. De Bondt (2002) finds that the debt securities market is tapped by non-financial corporations to fund their mergers and acquisitions, and investment or working capital financing needs; substitution between debt securities and other sources of corporate finance (in particular, banking) takes place, indirectly through financing cost differentials as well as directly. The empirical relationship found between corporate bond spreads and economic activity may capture the general degree of concern in the economy about credit risk.

3.2.3 European equity markets

By reducing the risk and information costs of European cross-border investment, EMU laid the foundations for rebalancing portfolios towards assets that previously were too costly in terms of the risk-return trade-off, thus improving the spread of fundamental risk in asset holdings.

It is well known, however, that the international diversification in equities has suffered from the so-called "home bias"; i.e., the share of international equity in total equity holdings by domestic investors has been much smaller than standard portfolio models predict.[21] (Adler and Dumas 1983). For instance, introduction of the euro implied a *de facto* elimination of the so-called "matching rule," according to which pension funds and insurance companies in many EU countries[22] had to hold at least 80 per cent of their assets in the same currency as their liabilities (which is usually the home currency). But, as Danthine, Giavazzi, and von Thadden (2000) document, the 80 per cent rule was usually not a binding restriction in most EMU countries in the early 1990s, which suggests that the introduction of the euro would not lead to an automatic reallocation of institutional investment.[23] This is consistent with the presumption that, so far, reasons other than currency must have kept equity investors from investing abroad.

Yet, the picture seems to have changed in the mid-1990s, even though this may not necessarily be due to EMU. For instance, the consolidation of European stock exchanges (e.g., the creation of Euronext and Virt-x) must be seen as a global rather than an EU-specific phenomenon. Similarly, the amazing performance of new-economy stock markets in the EU (e.g., Neuer Markt in

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21. The most plausible explanation for the home-bias puzzle seems to be asymmetric information and learning (see Gehrig 1993 and Hasan and Simaan 2000; for empirical analysis that lends support to the information-based explanation, see Tesar and Werner 1995, and Portes, Rey, and Oh 2001). Applying this argument to Europe, the lack of transparency and trading opportunities in continental European firms, as well as the weakly developed equity culture of European investors, would explain the paucity of equity flows into and out of Europe until the 1990s (Danthine, Giavazzi, and von Thadden 2000).
22. Including Austria, Belgium, Finland, Germany, Italy, the Netherlands, Portugal, and Spain.
23. For a detailed description of the European pension funds' asset management, see Field, Humphreys, and Sokolov (2000, 49–64).

Frankfurt) in the period around the launch of the EMU, and their subsequent slump, reflected U.S. developments (European Commission 2001, 143).

This performance is in line with Detken and Hartmann (2000), who find that the interest of global fund managers in acquiring euro-denominated equity during 1998 was short-lived. For domestic investors, however, Danthine, Giavazzi, and von Thadden (2000) document a visible upward trend, for all European countries, in the share of foreign to total financial assets, which suggests a gradual erosion of the home bias during the late 1990s. This is in line with Fratzscher (2001), who employed a generalized autoregressive conditional heteroscedasticity (GARCH) model on the uncovered asset return parity and found that European equity markets have become highly integrated only since 1996, with EMU being the major force behind this development.[24]

At the same time, however, it seems that correlations of equity returns across most sectors in the euro area have increased substantially, as Table 6 shows, which lists the average percentage change in returns to a shock of 1 per cent from the euro area and the United States, respectively.

Table 6 shows that the responsiveness of equity returns in the single EMU countries to shocks originating from the euro area increased markedly during the run-up to EMU (1993–98), and again during the first two years of EMU, while the influence of shocks from the United States on equity returns in the euro area seems to have decreased somewhat. The intensity of the effect differed among the EMU countries: while France, Germany, Italy, and Finland seem to be closely linked, the effect was felt less in Austria and Belgium.

Note also that the current responsiveness of Canadian equity returns to U.S. shocks is comparable in size to the one that prevailed in the euro area during the run-up to EMU (0.535 versus 0.500).

24. Recall from section 3.1.4 the high importance that Fratzscher (2001) attributes to exchange rate volatility in hindering equity market integration.

Table 6: Average Percentage Change in Equity Returns to a Shock of 1 Per Cent From the Euro Area and United States, Respectively

	Return spillovers from euro area				Return spillovers from the U.S.			
	Subperiods				Subperiods			
	1/86–7/92	8/92–7/93	8/93–4/98	5/98–6/00	1/86–7/92	8/92–7/93	8/93–4/98	5/98–6/00
Austria	0.119	0.224	0.313	0.364	0.095	0.270	0.322	0.210
Belgium	0.194	0.029*	0.373	0.547	0.275	0.252	0.305	0.214
Finland	NA	NA	0.665	1.096	NA	NA	0.695	0.772
France	0.288	0.072*	0.576	0.918	0.308	0.335	0.411	0.352
Germany	0.389	0.293	0.385	0.995	0.375	0.365	0.573	0.399
Italy	0.282	0.137*	0.557	0.977	0.319	0.258*	0.321	0.294
Netherlands	0.062	-0.012*	0.419	0.827	0.367	0.345	0.495	0.402
Spain	0.162	0.227*	0.656	0.843	0.319	0.359	0.373	0.256
Euro area **	**0.270**	**0.160**	**0.500**	**0.911**	**0.321**	**0.317**	**0.439**	**0.345**
Canada	-0.062*	0.071*	-0.101*	0.461	0.430	0.298	0.480	0.535

Source: Fratzscher (2001, 17 f.).

* Numbers are NOT significant at the 1 per cent level.

** Weighted averages of the estimated coefficients for the individual EMU countries, with the weights being GDP shares.

The increase in correlations of equity returns across EMU countries implies that diversification opportunities for investors are being reduced.[25] This phenomenon is not restricted to intra-euro-area correlations. Apparently, equity returns between the three major economic blocks—the euro area, the United States, and Japan—experienced an increase in correlation during the late 1990s, while the correlation of bond returns remained unchanged over the same period (Table 7).

25. Recall the discussion on the benefits of international risk-sharing in section 2.1.

Table 7: Correlation of Bond Equity Returns across Markets

	U.S. Germany (EURO)				Germany (EURO)/Japan				U.S./Japan			
	Bonds		Equities		Bonds		Equities		Bonds		Equities	
Correlations without currency	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly
1995–98	0.20	0.60	0.24	0.53	0.18	0.03	0.28	0.51	0.08	0.10	0.08	0.40
1998	0.29	0.62	0.43	0.72	0.23	0.22	0.29	0.49	0.14	0.22	0.15	0.54
1999	0.15	0.50	0.39	0.80	0.20	0.10	0.30	0.57	0.02	0.27	0.06	0.67

Source: Detken and Hartmann (2000, 51).

3.2.4 The European banking sector

The direct effects of EMU on the banking sector (in terms of transition costs and loss of foreign exchange revenue) were described briefly in sections 3.1.1 and 3.1.3. Another direct effect of the euro is the elimination of the so-called "anchoring principle," which was advocated by many European central banks and required domestic financial institutions to lead-manage bond issues (Prati and Schinasi 1997).

Moreover, the euro is expected to increase competitive pressures in the European banking industry indirectly by altering bank customers' attitudes (particularly on the wholesale level) and attracting new competitors (e.g., U.S. and U.K. investment banks). This will accelerate the process of disintermediation (in the sense that borrowers and investors turn away from banks to meet directly on capital markets), which already started with the surprising surge of corporate bond issuance documented in section 3.2.2.[26]

Considering the efforts to create a single market for financial services in the EU (the Single European Act of 1986, Second Banking directive of 1989, and Investment Services Directive of 1993), and the poor performance of European banks in terms of costs and revenues (see Prati and Schinasi 1997), it is surprising that European banks have not restructured and consolidated earlier.

26. Unlike U.S. banks, European banks played a dominant role in firm financing, not only for short-term but also for long-term maturities. In 2002, non-financial corporates were mainly financed through quoted shares and bank loans, with two thirds of the latter being of long-term maturity. While EU countries differ significantly in the size of the financial sector and in the relative role played by bank loans vs. stock markets, financing through debt securities has gained some importance only since 1999. For more details, see Thiel (2001, 7–13).

One plausible explanation for this fact is that the European banking system is still characterized by strong legal and supervisory constraints and a high degree of state involvement, which tends to shelter banks against competitive pressures and helps them reap economic rents.[27] Another possible explanation is the importance of the home-country relationship of banks, particularly with their retail customers.

There are several ways in which banks can adapt to the new situation. First, they can try to cut costs and improve productivity (thus taking advantage of recent technological progress; e.g., through electronic banking), which is difficult given the protective labour legislation and political dimension of the banking business in most European countries (see McCauley and White 1997).

A second possibility is to restore profit margins by taking on more risk. Such behaviour may raise concerns in terms of the stability of the financial system, and hence may not be considered desirable (see Carletti and Hartmann 2001).[28]

The third option, to which many banks have turned over the past decade, is mergers and acquisitions, and, more generally, the pursuit of cross-border alliances. To date, these mergers have been mainly domestic, with cross-border mergers still being the exception (see Field, Humphreys, and Sokolov 2000 for a detailed description).

To summarize, it seems unlikely that the introduction of the euro had more than a marginal *direct* effect on the structure of the European banking system, but by squeezing bank profits it may have given an important stimulus to the necessary restructuring in the banking industry. Its *indirect* effects may thus be comparable with those of the 1994 Riegle-Neal Act, which removed the interstate banking restrictions in the United States, thus vastly intensifying the reorganization of the U.S. banking market in the 1990s.

3.2.5 The euro as an international transaction and reserve currency

Before entering into the third stage of EMU, many observers were expecting the euro to attain the status of an international currency rivalling the dollar.[29] Currency hegemony comes with considerable advantages for the hegemon, in particular through seigniorage gains. According to Alogoskoufis, Portes, and Rey (1997), 50 to 60 per cent of the total stock outstanding of U.S. currency and 25 per cent of the total stock of U.S. government securities are being held by non-residents;

27. A recent striking example of anticompetitive behaviour in a nationally segmented market is the case of the Austrian banking system, which, in June 2002, was found guilty of coordinating interest rates and fined 124.26 million euros, the sixth-highest fine in the history of the EU antitrust authority.
28. Recall the discussion of systemic risk and risk management in a currency union in section 2.3.1.
29. See Prati and Schinasi (1997) for a more skeptical assessment.

this allows the United States to finance balance-of-payments deficits at no charge or at a substantial liquidity premium worth 0.2 per cent of GDP per year.

Alogoskoufis, Portes, and Rey (1997) develop several scenarios for the internationalization of the euro, pointing out the crucial role of transactions costs in foreign exchange and securities markets as well as the network externalities associated with the use of an international currency. They predict that the most likely scenario would be coexistence of the euro and U.S. dollar as international currencies, with the euro replacing the dollar as the dominant currency for exchanges between Europe and the Asian bloc, but the dollar still being the vehicle currency on the foreign exchange markets and the dominant reserve currency.

In terms of welfare, they concluded that if, in the long run, the euro could replace the U.S. dollar as the main international currency for financial asset transactions and take the role of vehicle currency on the foreign exchange markets, this would be associated with a gain (as flow) of 0.2 per cent in GDP for Europe, and a loss of 0.04 per cent and 0.07 per cent of GDP for the United States and Japan, respectively. The gains for Europe would come mainly from decreasing costs on the bond markets, while the losses for the United States and Japan would come from foreign exchange market transactions: both countries are better off when the dollar is the vehicle currency.[30]

The actual development of the international role of the euro was much closer to the more conservative scenario described above. After the first year of EMU, the emergence of the euro's international role was regarded as "normal" from what could have been expected before its introduction; while the euro gained importance quickly as a store of value, its role as an international medium of exchange was still very limited (Detken and Hartmann 2000).

According to the ECB (2001), the euro does not play a role comparable with that of the U.S. dollar as a vehicle currency in the foreign exchange market and as a pricing and quotation currency.

As a reserve currency, at the end of 1999 the euro accounted for 12.5 per cent of the foreign exchange reserve assets of IMF Member States, thus being the second world reserve currency, behind the U.S. dollar (66.2 per cent) and ahead of the Japanese yen (5.1 per cent).[31] Apparently,

30. Alogoskoufis, Portes, and Rey (1997) also point out that, from an aggregate point of view, world welfare is not maximized in either of these scenarios, but rather in a situation where the euro replaces the dollar as the main international currency for financial asset transactions, while the dollar remains the vehicle currency on the foreign exchange markets.

31. Compare this statistic with the numbers for 1997: U.S. dollar 62.1 per cent, Yen 5.3 per cent, Deutsche Mark 12.6 per cent.

the introduction of the euro did not cause aggregate reallocation of official reserves outside the euro area.

As an anchor and intervention currency, the euro plays some role in the exchange rate regime of 56 countries outside the euro area (mainly Eastern European, Mediterranean, and African countries); solutions adopted range from very strict links—or even full pegging—to the euro to looser forms of anchoring.

This use of the euro as anchor and intervention currency reflects in large part the role some legacy currencies played before the introduction of the euro; for example, the French franc in Africa and the Deutsche Mark in Eastern Europe. Note also that from the three EU member countries that did not introduce the euro (the United Kingdom, Sweden, and Denmark), only Denmark decided to peg its currency to the euro. Most Eastern European candidates for entry into the EU, such as Poland, Hungary, the Czech Republic, the Slovak Republic, and Slovenia, opted for a managed floating arrangement with the euro as a reference currency.

4. Lessons for Canada

Caution is advised when drawing lessons from the European experience for other currency union projects. NAMU would differ in many respects from EMU.

First, NAMU would involve a maximum of three countries (rather than 12 for EMU). Moreover, the U.S. and Canadian financial markets are already more integrated than the EU member countries: recall from Table 6 that the equity-return spillovers from the United States to Canada today are comparable in size to the spillovers from the (future) euro area to its members during the run-up to the EMU from 1993 to 1998 (Fratzscher 2001, 18).[32]

This confirms earlier results, for instance Paraskevopoulos, Paschakis, and Smithin (1996) and Afxentiou and Serletis (1993); the latter find that the correlation between domestic investment and savings in Canada is not as high as in other cross-section studies of industrial countries, which indicates that there has been substantial international capital mobility in the Canadian economy.

As discussed in section 2.1, financial market integration has important implications for the absorption of asymmetric shocks. We saw that international risk-sharing within the EU plays only a minor role: roughly 80 per cent of idiosyncratic shocks are unsmoothed (Melitz and Zumer

32. This is not meant to imply that the Canadian and U.S. stock markets are integrated, as highlighted by Ewing, Payne, and Sowell (1999).

1999). Compared with this number, the evidence of Canadian-U.S. risk-sharing appears to be much more favourable.

As discussed in section 2.1.2, Antia, Djoudad, and St-Amant (1999) show that there is much more consumption smoothing across Canada and the United States than across Europe (52 per cent versus 24 per cent), with the dominant channel of risk-sharing being international borrowing and lending. For North America, this implies that potential welfare gains that originate from any further financial market integration (as encouraged, for instance, by a monetary union) may be more moderate than in Europe.

Those in favour of NAMU claim that a monetary union with the United States would be preferable to the unilateral dollarization of the Canadian economy (for instance, see Courchene and Harris 2000, and Chriszt 2000),[33] and they argue two points to support their claim.

First, unilateral dollarization would result in a loss of seigniorage, while, under a monetary union, the Bank of Canada would continue to receive seigniorage that would accrue to the Canadian government (Grubel 2000). The seigniorage revenue of a country under a monetary union, however, need not correspond to its share in the money base and thus to the seigniorage that the country would have raised had it not joined the monetary union.

Under EMU, the production of bills and coins, and therefore seigniorage profits, are pooled. The ECB's profits are distributed among its shareholders (the central banks of EMU-participating countries) in proportion to their paid-up shares in the ECB's capital. These shares are, of course, fairly arbitrary and do not necessarily reflect the share in the euro money base of that specific country. As a result, countries such as France and Portugal benefit greatly from this system, while Germany and Spain lost substantial parts of their seigniorage after the introduction of the euro.

The second point argued against unilateral dollarization is that monetary policy in the region would be determined solely by the actions of the U.S. Federal Reserve, which would not take the needs of the Canadian economy into account.[34] In other words, the unavoidable trade-off between gains from coordination and loss of national sovereignty seems to be more favourable for Canada under a monetary union.

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33. In contrast to these authors, who maintain that dollarization of the Canadian economy would be an ongoing and well-advanced process, Murray and Powell (2002) show that there is no evidence to support this claim. Instead, they find that the Canadian dollar continues to be used as the principal unit of account, medium of exchange, and store of value within Canadian borders, and there is no indication that dollarization is likely to take hold in the foreseeable future.

34. Canada's influence on the Fed's monetary policies would remain marginal even in the case of a full-fledged monetary union, with Canada (and Mexico) holding at most one seat on the FOMC.

This argument highlights an important difference between EMU and NAMU: unlike the EU, the United States and Canada do not have common political institutions, and are not likely to have them in the near future (see Buiter 1999).

5. Conclusion

This paper has reviewed both the theoretical and empirical literature on the impact of monetary unions on financial markets, and evaluated the first three years of EMU in this respect.

If we assume that multiple currencies prevent national financial markets from integrating, a currency union can improve welfare in two ways. First, agents will be encouraged to diversify their portfolios internationally, thus obtaining decentralized insurance against asymmetric shocks to their income. The evidence shows that idiosyncratic shocks are larger, and smoothing is lower, internationally relative to nationally, and that a large share of international risk-sharing is due to diversified property holdings in the European case, and to cross-border borrowing and lending in the U.S.-Canadian case.

Second, financial integration can foster growth by enhancing the quality of investment, and by encouraging riskier and more long-term investment. Empirically, there seems to be a consensus about the strong impact of financial development on growth for developing countries, while the evidence for industrial countries remains inconclusive.

Although financial integration has developed significantly in the EU over the past 10 years, there is no doubt that European financial markets are still fairly segmented along national borders. With recent estimates of potential welfare gains of 0.5 to 0.7 per cent of EU GDP per year, financial market integration was assigned a high priority on the EU economic reform agenda adopted in 2000.

While public policies can contribute to encouraging financial integration, integrated financial markets can have important feedback effects on public policies themselves. By homogenizing financial structures, integration affects the likelihood of systemic crises as well as the effectiveness of some of the policy instruments (namely, the transmission mechanisms) deployed to manage those crises.

The experiences that European financial markets have had introducing the euro shows that monetary union can indeed provide an important stimulus towards financial integration, both directly and indirectly.

First, the introduction of EMU implied that all foreign exchange trade between the euro legacy countries simply became redundant. In 1998, the last year before EMU took effect, this trade amounted to an average daily turnover of roughly US$130 billion. Moreover, intra-European currency risk, which played an important role in shaping trade and investment patterns, was eliminated.

Along with a certain homogenization of issuance practices in the public bond markets, these direct effects of EMU helped remove obstacles that had shaped European trade and investment patterns, thus promoting the integration of European financial markets.

The stimulus caused by EMU was reflected differently in various financial markets. The European corporate bond market expanded dramatically during the first months of EMU, although the strong increase in supply seemed to dominate for some time, a situation that was blamed for the initially weak stance of the euro exchange rate vis-à-vis the U.S. dollar.

While the European corporate bond market can be considered fully integrated, the European government bond markets are still somewhat segmented. The most likely explanation for the persistence of yield spreads among different national issuers is the importance of sovereign credit risk and liquidity premia.

If high equity-return correlations can be considered as evidence of deep integration, then the integration of European equity markets has certainly made substantial progress, although the phenomenon was not restricted to the euro area alone; higher return correlation also implies less opportunities for diversification.

Apart from initial adjustment costs and the loss of some sources of revenue, the European banking sector was probably only marginally affected by EMU. Still, EMU may have contributed indirectly to increasing competitive pressures in this sector, as certified by the remarkable consolidation efforts in that industry.

What can we infer from the European experience for a potential NAMU? First, it seems that the U.S. and Canadian financial markets are already more integrated than were the European ones immediately before the introduction of the euro. This implies that potential welfare gains originating from any further financial market integration (as encouraged, for instance, by a monetary union) may be more moderate than in the European case.

Finally, it has been argued in favour of NAMU that a monetary union with the United States would be preferable to the unilateral dollarization of the Canadian economy. This argument highlights an important difference between EMU and NAMU: unlike in the EU, the United States and Canada do not have common political institutions, and are not likely to have them in the near future.

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